

REPORT

# On tour at one of Europe's largest retrofitting sites

By [youris.com](http://www.youris.com) GEIE

<http://www.youris.com>

**The Torrelago district in Laguna de Duero, Spain is home to about 4,500 inhabitants in nearly 1,500 dwellings and 31 early 1980's buildings. A deep energy efficient retrofit is taking place as part of the EU funded CITYFiED project and captured the attention of policy makers, councillors and energy experts from nineteen European cities and the project consortium during an in depth study tour.**



The Torrelago district in Laguna de Duero, Spain is home to about 4,500 inhabitants in nearly 1,500 dwellings and 31 early 1980's buildings. A deep energy efficient retrofit is taking place as part of the EU funded CITYFiED project and captured the attention of policy makers, councillors and energy experts from nineteen European cities and the project consortium during an in depth study tour.

Construction experts 3iA and global resource management company Veolia were on hand to give their insight into this vast site.

An international group of policy makers, energy experts, technical agencies and project consortium members visited the Torrelago district on 28 February and 1 March 2017 to see first hand, how ambitious local and European energy targets are being met with large-scale district retrofitting actions. Speaking to the second group at the Laguna de Duero town hall, CITYFiED project officer Mr. Mario Dionisio of DG Energy, Mayor of Laguna de Duero, Roman Rodriguez de Castro, and project coordinator Dr. Ali Vasallo gave the context before an in-person tour of the works and installations.

European energy policy was presented – by both top-down and local government levels – as a unique opportunity to modernise the economy, boost competitiveness and create growth and jobs thanks to the EU's ambitious energy and climate commitments (Paris 2015, COP21). Mr Dionisio also shared how European Union's Winter Package added additional definition to a strategy of putting energy efficiency first, achieving global leadership in renewable energies and providing a fair deal for consumers as well as latest Eurostat figures for final energy consumption across multiple sectors. Residential buildings were unsurprisingly key consumers and as such projects like CITYFiED are vital to meeting stated 2030 goals. The project will provide 73% reduction in energy use to 260.000 m<sup>2</sup> of retrofitted living space.

In Torrelago, 31 twelve floor buildings have been divided into five stages of works with a number of initiatives underway: façade renovation, new biomass district heating, new pumping system, a combined heat and power facility, smart grid and a state of the art monitoring platform. Technical visits focused primarily on the huge façade works and new biomass heating system.

### **140,000 m<sup>2</sup> of insulation**

An external insulation system is being used, with a total surface of approximately 140,000 m<sup>2</sup> of 8cm thick expanded polystyrene panels (EPS), with a thermal conductivity between 34 and 40 miliwatts per meter and degree being applied to the facade. The insulation is fixed chemically using adhesive mortars and mechanical fixation plugs and anchors, with eight fixations per square meter. Particular attention has had to be paid around the astounding 12,000 windows, where the finishing is customized in each case. A mix of tubular, electric zippered and hung types of scaffolding was used during the process to navigate the contours of the buildings and optimise time and resources.

To protect and further secure the fresh envelope, two layers of mortar with a fiberglass mesh between supports the system. After covering, 3iA must wait 15 days for the products to dry and the finishing materials to be applied correctly. Once this period has finished, a primer coat is applied as a bridge between the mortar and final finish. Finally, a last layer of acrylic finish is applied, which has self-cleaning, anti-bacterial and anti-mold properties that improve durability, including the definitive color of the façade and anodized aluminum plates around the windowsills. With all this in place and considering the initial facade of the building, the result is a thermal transmittance of less than 0.34 W/m<sup>2</sup>K compared to 1.36 W/m<sup>2</sup>K for the previous wall.

### **Building towards biomass**

District heating and biomass are both a relatively rare departure in Spain and by introducing an ambitious new system some initial reticence from residents had to be overcome. Today, with phases one and two of five complete, Veolia and the local CITYFiED partners have an excellent operational track record and plenty of positive feedback from residents to fuel their future ambitions.

The brand new biomass system currently accounts for 60% of heating needs, climbing to more than 80% as the project nears completion and provides excellent availability of hot water and thermal comfort. A common pinch point for district systems, tenants have decision-making power for heating set points and heating schedules. The new system has also been a catalyst for additional improvements not directly in CITYFiED's scope. These include a collective action to insulate and update roofing and individual actions to upgrade to modern double and triple glazed windows.

Operations and maintenance of the new system is being closely studied with quality tests, heating simulations and performance studies in advance of a full deployment across the district. Taking it to the next level will be applying the series of technologies into a Combined Heat and Power (CHP) smart grid system with Home Energy Management Systems (HEMS) installed in each dwelling. A small pilot group will help refine the firmware, database consolidation and visualisation applications destined for both operational and consumer facing use. Together with ICT partners from across the project and inspired by actions in Lund and Soma, a second prototype for the visualisation tools is already underway.

The CITYFiED project would like to thank Laguna de Duero, 3iA and Veolia teams for their memorable welcome and detailed visit. Interested parties can follow the @Cityfied\_eu twitter feed or LinkedIn page to be sure not to miss further developments.